भारतीय मानक

Indian Standard

IS 3383 : 2023

सल्फर वेटेबल पाउडर्स — विशिष्टि

(तीसरा पुनरीक्षण)

Sulphur Wettable Powders — Specification

(Third Revision)

ICS 65.100.30

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

May 2023 **Price Group 5**

Pesticides Sectional Committee, FAD 01

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides Sectional Committee had been approved by the Food and Agriculture Divisional Council.

Wettable sulphur powder is largely used for the control of pests and diseases in the field of agriculture.

Wettable sulphur powder is generally manufactured to contain 80 percent (*m*/*m*) of sulphur.

This standard was first published in 1965 and subsequently revised in 1975. Some of the requirements like sulphur content and suspensibility were changed through the issue of three amendments. In the second revision issued in 1982, the various requirements were reviewed in the light of experience gained in the country and also the reference of IS 8190 (Part 1) for packing requirements was incorporated.

In this revision, the standard has been brought out in the latest style and format of the Indian Standards, and references to Indian Standards wherever applicable have been updated. It also incorporates two amendments issued to this standard.

In the preparation of this standard, due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the rules framed thereunder. However, this standard is subject to restrictions imposed under the act and rules wherever applicable.

The composition of the committee responsible for the formulation of this standard listed in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SULPHUR WETTABLE POWDERS — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for wettable sulphur powder.

2 REFERENCES

The standards listed in Annex A contains provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 REQUIREMENTS

3.1 Description

The material shall be in the form of a homogeneous powder, pale yellow to brownish in colour, and shall wet readily on mixing with water, providing a suspension suitable for use as a spray.

3.2 The material shall also comply with the requirements given in Table 1.

NOTE — The material shall not be subjected to accelerated storage treatment if it has crossed half life of its shelf life as ascertained from its date of manufacture and date of expiry declared on the container.

3.2.1 *Sulphur Content*

When determined by the method prescribed in Annex A, the observed sulphur content, percent (*m*/*m*), of any of the samples shall not differ from the declared nominal value by more than the percent tolerance limits indicated below:

Nominal Value, Percent	*Tolerance Limits, Percent*	
Up to 9	+10 -5	of the nominal value
Above 9 and below 50	+5 - 5	
50 and above	+5 - 3	

Table 1 Requirements for Sulphur Wettable Powder
(*Clause* 3.2)

Sl No.	Characteristics	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Sulphur content, percent by mas, *Min*	Nominal value as declared on the container (*see* **3.2.1**)	Annex B
ii)	Material passing through 45 micron IS Sieve [*see* IS 460 (Part 1)], after accelerated storage, percent by mass, *Min*	99.9	IS 6940
iii)	Suspensibility, after accelerated storage, percent by mass, *Min*	80	IS 6940
iv)	Wettability, *Max*	120 seconds	IS 6940
v)	Arsenic (as As), percent by mass, *Max*	0.01	Annex C

4 PACKING

4.1 Packing

The material shall be packed as per requirements given in IS 8190 (Part 1).

5 MARKING

5.1 The containers shall bear legibly and indelibly the following information:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch number;
d) Date of manufacture;
e) Date of expiry;
f) Net quantity;
g) Nominal sulphur content, percent (*m*/*m*)
h) A cautionary notice as worded in the *Insecticide Act*, 1968, and rules framed thereunder; and
j) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627. However, the criteria for conformity of the material when tested, shall he the limits of tolerances, as applicable over the declared nominal value and given under **3.2.1** of the standard.

7 TESTS

7.1 Tests shall be carried out by the prescribed methods referred to in col (4) of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE —‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A
(*Clause* 2)

LIST OF REFFRRED STANDARDS

IS No.	*Title*	*IS No.*	*Title*
IS 460 (Part 1) : 2020	Test Sieves — Specification: Part 1 Wire cloth test sieves (*fourth revision*)	IS 6940 : 1982	Methods of test for pesticides and their formulations (*first revision*)
IS 1070 : 1992	Reagent grade water (*third revision*)	IS 8190 (Part1) : 1988	Requirement for packing of pesticides: Part 1 Solid pesticides (*second revision*)
IS 2088 : 1983	Methods for determination of arsenic (*second revision*)	IS 10627 : 1983	Methods for sampling of pesticidal formulations

ANNEX B
[*Clause* 3.2.1 and *Table* 1, *Sl No.* (i)]

DETERMINATION OF SULPHUR CONTENT

B-1 PRINCIPLE

B-1.1 The sulphur present in the formulation is converted to thiosulphate and then determined iodimetrically.

B-2 REAGENTS

B-2.1 Sodium Sulphite — Crystalline

B-2.2 Liquid Paraffin

B-2.3 Formaldehyde — 40 percent (*v*/*v*)

B-2.4 Acetic Acid Solution — 20 percent (*v*/*v*)

B-2.5 Standard Iodine Solution — 0.1 N, freshly prepared

B-2.6 Starch Indicator Solution — 0.5 percent, freshly prepared

B-2.7 Carbon Tetrachloride

B-3 PROCEDURE

B-3.1 Weigh accurately sufficient quantity of the sample to contain 0.1 g of sulphur and transfer it to an Erlenmeyer flask, add 30 ml to 40 ml of water, 2 g of sodium sulphite and about 1 ml to 2 ml liquid paraffin.

B-3.2 Attach the condenser, Warm gently until the sulphur has dissolved, then boil it for 40 minutes, cool and remove the condenser. Add 10 ml of formaldehyde, 10 ml of acetic acid and 25 ml of carbon tetrachloride to the solution to remove the paraffin. Titrate immediately with the standard iodine solution using starch solution as indicator.

B-3.3 Carry out a blank determination on the reagents.

B-4 CALCULATION

B-4.1 Sulphur content, percent by mass =

$$\frac{0.03206\,(v - V)\,N \times 100}{m}$$

where

v = volume, in ml, of the standard iodine solution required for the test with the material (*see* **B-3.2**);

V = volume, in ml, of the standard iodine solution required for the blank determination (*see* **B-3.3**);

N = normality of the standard iodine solution; and

m = mass, in g, of the sample taken for the test.

ANNEX C
[*Table* 1, *Sl. No.* (v)]

DETERMINATION OF ARSENIC

C-1 METHOD

C-1.1 For the determination of arsenic (as As) the modified Gutzeit method as prescribed in IS 2088 shall be followed. The procedure for the preparation of the solution for the test method shall be as prescribed in **C-2**.

C-2 PREPARATION OF THE SOLUTION

C-2.1 Weigh 10 g of the material into a 500 ml Kjeldahl flask. Add 40 ml of a mixture of 2 volumes of bromine and 3 volumes of carbon tetrachloride, and allow the flask to stand for 30 minutes with occasional shaking. Add 50 ml of arsenic-free concentrated nitric acid, dropwise, swirling the flask continuously, and occasionally putting into an ice-bath to prevent, ice-heating and excess fumes. If any unoxidized sulphur remains at the end of this treatment, add again 5 ml of bromine-carbon tetrachloride mixture and 10 ml of nitric acid. When all the sulphur is oxidized to sulphuric acid, place the flask on a steam-bath to drive off the bromine and carbon tetrachloride slowly, and then on a hot-plate until fumes of sulphur trioxide are evolved. If the resulting solution is not colourless, cool, add 10 ml of nitric acid, and repeat the evaporation on the hot-plate until fumes of sulphur trioxide are evolved. Finally, cool the solution, add 50 ml of water, and evaporate to fumes of sulphur trioxide. Usually two or three additions of water with subsequent evaporation are necessary to remove the last traces of nitric acid from the sulphuric acid formed.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Pesticides Sectional Committee, FAD 01

Organization	*Representative*(*s*)
Directorate of Plant Protection Quarantine and Storage, Faridabad	DR RAVI PRAKASH (***Chairperson***)
All India Biotech Association, New Delhi	SHRI SAURABH SINGHAL SHRI SHAH JI DHAR (*Alternate*)
Central Insecticide Board and Registration Committee, Faridabad	SECRETARY DR VANDANA SETH (*Alternate*)
Central Insecticide Laboratory, Faridabad	DR ARCHANA SINHA SHRI SUBHASH CHAUDHARY (*Alternate*)
Consumer Guidance Society of India, Mumbai	SHRI SITARAM DIXIT DR. M. S. KAMATH (*Alternate*)
Crop Care Federation of India, New Delhi	DR J. C. MAJUMDAR
Crop Life India, New Delhi	SHRI ASITAVA SEN MS NIRUPAMA SHARMA (*Alternate*)
CSIR-Indian Institute of Toxicology Research, Lucknow	DR SHEELENDRA P. SINGH
FMC India Pvt Ltd, Bengaluru	SHRI CHIRAG PATEL
Food Safety and Standards Authority of India, New Delhi	ADVISOR (STANDARDS)
IDMA Laboratories Ltd, Chandigarh	DR INDRA RAI
Indian Agricultural Research Institute, New Delhi	DIRECTOR
Indian Institute of Packaging, Mumbai	DR TANWEER ALAM
Indian Pest Control Association, New Delhi	SHRI UDAYAN GHOSH
Institute of Pesticide Formulation Technology, Gurgaon	DR M. VAIRAMANI

Organization	*Representative*(*s*)
Ministry of Agriculture, Department of Agriculture, Chennai	JOINT DIRECTOR OF AGRICULTURE (RES) DEPUTY DIRECTOR LAB (*Alternate*)
National Centre for Integrated Pest Management, New Delhi	DR SUMITRA ARORA
National Institute of Plant Health Management, Hyderabad	DR MAHESH SAINI MS T. SRIDEVI (*Alternate*)
Pesticide Manufactures and Formulators Association of India (PMFAI), Mumbai	DR ARCHANA SRIVASTAVA DR UDAY KUMAR (*Alternate*)
Regional Pesticides Testing Laboratory, Chandigarh	SHRI V. VASU
In Personal Capacity *(4-6-90/2/8/2, Sri Devi Nilayam Tejaswinagar Coloni, Attapur - 500048)*	SHRI C. V. RAO
In Personal Capacity *(263, Sector 28, Faridabad - 121008)*	SHRI VIPIN SAINI
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'E'/DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (*Ex- officio*)]

Member Secretary
SHRI KULDEEP MITTAL
SCIENTIST 'B'/ASSISTANT DIRECTOR
(FOOD AND AGRICULTURE), BIS

Bureau of Indian Standards

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Review of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

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